

Výsledky domácích úkolů na rozklady matic a pseudoinverzní matice

1.

$$A = \begin{pmatrix} \frac{\sqrt{3}}{15} & \frac{3\sqrt{2}}{10} & \frac{11\sqrt{6}}{30} \\ \frac{\sqrt{3}}{3} & \frac{\sqrt{2}}{2} & -\frac{\sqrt{6}}{6} \\ \frac{7\sqrt{3}}{15} & -\frac{2\sqrt{2}}{5} & \frac{\sqrt{6}}{15} \end{pmatrix} \cdot \begin{pmatrix} \sqrt{15} & 0 \\ 0 & \sqrt{10} \\ 0 & 0 \end{pmatrix} \cdot \begin{pmatrix} \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \\ -\frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \end{pmatrix}^{\top}.$$

$$A^{(-1)} = \begin{pmatrix} \frac{13}{150} & \frac{7}{30} & \frac{8}{75} \\ \frac{8}{75} & \frac{2}{15} & -\frac{19}{75} \end{pmatrix}.$$

2.

$$B = \begin{pmatrix} \frac{3\sqrt{10}}{10} & \frac{\sqrt{10}}{10} \\ -\frac{\sqrt{10}}{10} & \frac{3\sqrt{10}}{10} \end{pmatrix} \cdot \begin{pmatrix} \sqrt{15} & 0 & 0 \\ 0 & \sqrt{5} & 0 \end{pmatrix} \cdot \begin{pmatrix} \frac{\sqrt{6}}{15} & \frac{2\sqrt{2}}{5} & \frac{7\sqrt{3}}{15} \\ \frac{\sqrt{6}}{6} & \frac{\sqrt{2}}{2} & -\frac{\sqrt{3}}{3} \\ \frac{11\sqrt{6}}{30} & -\frac{3\sqrt{2}}{10} & \frac{\sqrt{3}}{15} \end{pmatrix}^{\top}.$$

$$B^{(-1)} = \begin{pmatrix} \frac{3}{25} & \frac{17}{75} \\ \frac{1}{5} & \frac{4}{15} \\ \frac{4}{25} & -\frac{19}{75} \end{pmatrix}.$$

3.

$$G = \begin{pmatrix} \frac{5}{3} & \frac{2}{3} & \frac{4}{3} \\ \frac{2}{3} & \frac{5}{3} & \frac{4}{3} \\ \frac{4}{3} & \frac{4}{3} & \frac{11}{3} \end{pmatrix} \cdot \begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{2}{3} \\ -\frac{2}{3} & -\frac{1}{3} & \frac{2}{3} \\ \frac{2}{3} & -\frac{2}{3} & \frac{1}{3} \end{pmatrix}.$$

4.

$$H = \begin{pmatrix} \frac{8}{7} & \frac{3}{7} & \frac{5}{7} \\ \frac{3}{7} & \frac{16}{7} & \frac{15}{7} \\ \frac{5}{7} & \frac{15}{7} & \frac{32}{7} \end{pmatrix} \cdot \begin{pmatrix} \frac{6}{7} & -\frac{3}{7} & -\frac{2}{7} \\ -\frac{3}{7} & -\frac{2}{7} & -\frac{6}{7} \\ \frac{2}{7} & \frac{6}{7} & -\frac{3}{7} \end{pmatrix}.$$

5.

$$x = \frac{3}{5}, \quad y = \frac{1}{5}.$$